

Targeting Stem Cells to Enhance Remyelination in the Treatment of Multiple Sclerosis

Grant Award Details

Targeting Stem Cells to Enhance Remyelination in the Treatment of Multiple Sclerosis

Grant Type: Early Translational III

Grant Number: TR3-05617

Project Objective: The objective of this project is to develop a stem cell-based therapeutic approach aimed at enhancing regeneration of the myelin sheath. Specifically, the project is focused on the identification of drug-like molecules capable of inducing oligodendrocyte precursor cell (OPC) differentiation. They have identified a series approved drugs that effectively induce OPC differentiation under tissue culture conditions and have demonstrated that several of these drug candidates reduce MS-like symptoms in relevant rodent models of the disease. The focus is to conduct a detailed pharmacology experiments to determine which of the identified molecules will serve as the best candidate for future clinical development.

Investigator:

Name:	Peter Schultz
Institution:	Scripps Research Institute
Type:	PI

Disease Focus: Multiple Sclerosis, Neurological Disorders

Human Stem Cell Use: Adult Stem Cell

Cell Line Generation: Adult Stem Cell

Award Value: \$2,559,333

Status: Closed

Progress Reports

Reporting Period: Year 1

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Reporting Period: Year 2

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Reporting Period:	Year 3
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Reporting Period:	Year 4/NCE
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Grant Application Details

Application Title:	Targeting Stem Cells to Enhance Remyelination in the Treatment of Multiple Sclerosis
Public Abstract:	Multiple sclerosis (MS) is an autoimmune disease in which the myelin sheath that insulates neurons is destroyed, resulting in loss of proper neuronal function. Existing treatments for MS are based on strategies that suppress the immune response. While these drugs do provide benefit by reducing relapses and delaying progression (but have significant side effects), the disease invariably progresses. We are pursuing an alternative therapy aimed at regeneration of the myelin sheath through drugs that act on an endogenous stem cell population in the central nervous system termed oligodendrocyte precursor cells (OPCs). Remission in MS is largely dependent upon OPCs migrating to sites of injury and subsequently differentiating into oligodendrocytes – the cells that synthesize myelin and are capable of neuronal repair. Previous studies indicate that in progressive MS, OPCs are abundantly present at sites of damage but fail to differentiate to oligodendrocytes. As such, drug-like molecules capable of inducing OPC differentiation should have significant potential, used alone or in combination with existing immunomodulatory agents, for the treatment of MS. The objective of this project is to identify a development candidate (DC) for the treatment of multiple sclerosis (MS) that functions by directly stimulating the differentiation of the adult stem cells required for remyelination.
Statement of Benefit to California:	Multiple Sclerosis (MS) is a painful, neurodegenerative disease that leads to an impairment of physical and cognitive abilities. Patients with MS are often forced to stop working because their condition becomes so limiting. MS can interfere with a patient's ability to even perform simple routine daily activities, resulting in a decreased quality of life. Existing treatments for MS delay disease progression and minimize symptoms, however, the disease invariably progresses to a state of chronic demyelination. The goal of this project is to identify novel promyelinating drugs, based on differentiation of an endogenous stem cell population. Such drugs would be used in combination with existing immunosuppressive drugs to prevent disease progression and restore proper neuronal activity. More effective MS treatment strategies represent a major unmet medical need that could impact the roughly 50,000 Californians suffering from this disease. Clearly the development of a promyelinating therapeutic would have a significant impact on the well-being of Californians and reduce the negative economic impact on the state resulting from this degenerative disease.

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